1893MNRAS..54R.100E

Two New Variable Stars. By the Rev. T. E. Espin, M.A.

On August 21, while sweeping for stars with remarkable spectra, I came across a fine red star which was found to be wanting in Argelander's charts. The place obtained for it was:—

R.A. $19^h\ 7^m\ 15^s{\cdot}8$ Decl. + 25° 46′·4 (1855).

The spectrum was banded, and believed to be III. type. As I suspected it might turn out to be variable, it was watched. On September 27 it was found to have diminished a magnitude. The following are my observations of it:—

1893.	Mag.		Mag.
Aug. 21	9·0	Oct. 11	11
Sept. 7	10·0	Nov. 13	11·5
Oct. 4	10·3	Dec. 1	12·0

On August 24, while sweeping in *Cygnus*, another fine red star was detected. It was near the place of a star of Argelander's, and was one of a wide pair. Careful differentiation on September 12 gave me for its place:—

R.A. $20^h\ 46^m\ 59^s{\cdot}3$ Decl. + 46° 47′·2.

It therefore is $18^s{\cdot}7$ f. DM. + 46°·3078, mag. 9·5. In the spectroscope the two star-spectra overlap, but it is evidently banded, and appeared more like type III. than IV. As this region had been swept over in previous years and no red star noted in this place, I concluded it was probably a new variable. It was not till October 4 that any change was noted, and even then the loss of light was so small that it would not have been seen except for the neighbouring star. The following are my observations of it:—

1893.	Mag.		Mag.
Aug. 24	9·1	Nov. 13	10·8
Oct. 6	9·4	Dec. 1	11·5
Oct. 11	9·6		

Note on the Spectra of Certain Red Stars.
By the Rev. T. E. Espin, M.A.

In the summer the mirrors of the 17¼-inch were resilvered, and during the autumn the telescope has been used for re-examining the spectra of certain stars and for sweeping over the red region in *Cygnus*. I give herewith the results:—

1893MNRAS..54R.100E

(1) *Es. Birm* 57, R.A. $2^{\mathrm{h}}\ 43^{\mathrm{m}}{\cdot}3$, Decl. + 56° 34′ (1900), Mag. 9·4. This is D.M. + 56°·724. This red star was found by Pickering, who suspected bands. Dunér at first believed its spectrum to be IV. type, but afterwards thought it III. My observations of it are 1891 December 22 in moonlight IV., mag. 9·2. (The neighbouring star D.M. + 56°·725, mag. 9·0.) December 29 III.!! Spectrum faint; mag. 9·0. It was re-observed 1893 December 1, when I was at once struck with its increased brilliancy. It was then quite equal to D.M. + 56°·728, mag. 8·5. The spectrum type III.!! The star is variable.

(2) *Anonymous*, R.A. $19^{\mathrm{h}}\ 16^{\mathrm{m}}{\cdot}6$, Decl. + 37° 41′ (1900). A fine red star near G.C. 6791. It is 9·0 mag., and evidently banded, and, I believe, type IV. It was detected on 1893 September 16, and up to November 13 was found constant in light. Its absence from the D.M. is suspicious, and it may be variable.

(3) *Anonymous*, R.A. $20^{\mathrm{h}}\ 5^{\mathrm{m}}{\cdot}0$, Decl. + 35° 31′ (1900). A red star, mag. 10, found 1893 August 14, and showing a banded spectrum, which is possibly type IV.

(4) *Es. Birm* 654, R.A. $20^{\mathrm{h}}\ 7^{\mathrm{m}}{\cdot}3$, Decl. + 35° 48′ (1900). A very red star of type IV., found by Pickering, who gives mag. 12, and thought it possibly variable. It was observed 1893 September 16, mag. 11·0, type IV., and on several other nights, the last December 2, and no variation seen. It was found on two photographs taken with the 8-inch 1893 April 13 and October 16, and so far appears constant.

(5) *Anonymous*, R.A. $20^{\mathrm{h}}\ 12^{\mathrm{m}}{\cdot}3$, Decl. + 37° 34′ (1900). A red star, mag. 10, found 1893 August 22. Banded spectrum, and possibly type IV.

(6) *Anonymous*, R.A. $20^{\mathrm{h}}\ 13^{\mathrm{m}}{\cdot}3$, Decl. + 36° 36′ (1900). A red star, mag. 11·5, found 1893 September 16. Spectrum very faint, but pretty certainly banded, and believed to be type IV.

(7) *Es. Birm* 664, R.A. $20^{\mathrm{h}}\ 17^{\mathrm{m}}{\cdot}6$, Decl. + 36° 37′ (1900). This is D.M. + 36°·4025, and is the p. star of two. This star was re-examined on August 14, and found not to be type IV. but type III.!! The magnitude of the star in the D.M. is 9·5, and my observations suggest variability in its light. Using D.M. + 36°·4020, mag. 8·4; D.M. + 36°·4028, mag. 9·5, as comparison stars, my observations are:—

1885.	Mag.	1890.	Mag.
July 2	9·7	Aug. 15	8·5
		1893.	
„ 9	9·7	Aug. 14	8·4
1886.			
June 22	9·0	Aug. 24	8·4
Aug. 29	8·7	Sept. 16	8·6
1887.			
April 14	9·0	Dec. 1	8·2

1893MNRAS..54R.100E

On a photograph taken by Max Wolf, 1891, the estimated magnitude is 11·3, and on two photographs taken with the 8-in., mentioned under No. 4, the magnitudes are 12·5 and 12·2.

(8) RR. *Cygni*, $20^{h}\ 42^{m}{\cdot}6$, Decl. + 44°30′ (1900). As the spectrum of this star remains in doubt, it was examined on the nights of August 8, September 9, and was found to be III.!! The bands are large and ill-defined, but the character of the spectrum is undoubted.

(9) *Es. Birm* 706, R.A. $21^{h}\ 23^{m}{\cdot}3$, Decl. 62° 8′·4 (1900). This is D.M. + 61°·2134. In consequence of there being some uncertainty about the type, it was examined 1893 September 30, and found to be type III.!!

(10) D.M. + 60°·2432, $22^{h}\ 40^{m}{\cdot}4$, Decl. 61°12′ (1900), mag. 8·9. This star was encountered in sweeping 1893 October 8, and found to have a spectrum of type IV.

(11) *Es. Birm* 735, R.A. $22^{h}\ 43^{m}{\cdot}7$, Decl. + 54° 38′ (1900), mag. 9·5, D.M. + 58°·2863. On 1893 October 8 I examined this star, and found it had hitherto been wrongly identified as D.M. + 58°·2865. The spectrum is not IV. but III.!! My observations of its magnitude are:—

1887.	Mag.	1893.	Mag.
Oct. 20	8·5	Oct. 8	8·5
Dec. 4	8·2	11	8·3
Dec. 7	8·5	16	8·3
		Dec. 1	8·3

My observations are therefore very accordant, but still, the great difference between them and the D.M. magnitude suggests variation.

(12) *Es.* 141, R.A. $23^{h}\ 22^{m}{\cdot}2$, Decl. + 48°58′ (1900), mag. 9·3. This is D.M. + 48°·4051. The spectrum was observed for the first time on 1893 December 1, and found to be type IV., the three normal zones being well seen.

On the Orbit of α Centauri. By T. J. J. See, A.M., Ph.D. (Berlin).

(*Communicated by S. W. Burnham.*)

The orbit of *α Centauri* has been investigated so frequently in the last quarter of a century that the elements of this famous southern binary ought now to be well determined. But owing to the discordance of the older observations, even the recent orbits of Elkin * and Powell † give periodic times differing by

* *Inaug.-Dis.*, *Ueber die Par. von α Cent.*, p. 8. † *M. N.* vol. xlv. p. 19.